Motorola HOME RADIO

SERVICE MANUAL

MODELS
52R11B
52R12B
52R13B
52R14B
52R15B
52R16B

CHASSIS
HS-367

GENERAL INFORMATION

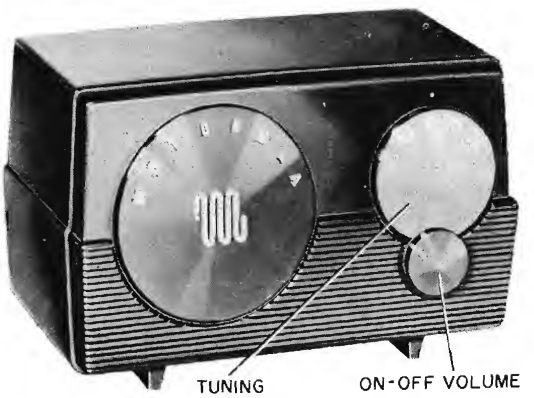
TYPE - AC-DC table model superheterodyne receiver with "printed" circuit and Ferrite Magnetic Iron Core Antenna.

RECEIVER MODELS -

Model	Color
52R11B	Walnut
52R12B	Ivory
52R13B	Maroon
52R14B	Gray
52R15B	Green
52R16B	Red

TUBE COMPLEMENT -

Type	Function
12BE6	Converter
12BD6	IF Amplifier
12AT6	Det, AVC & AF Amp
50C5	Power Amplifier
35W4	Rectifier



TUNING RANGE - 535 to 1620 Kc IF - 455 Kc

POWER SUPPLY - 117 volts AC or DC; 35 watts

INSTALLATION & OPERATING INSTRUCTIONS

POWER SWITCH & VOLUME CONTROL. Operated with the small lower knob. NOTE: Reverse the line cord plug in the wall outlet if radio does not operate from DC. When operating from AC, reversing the line cord plug in the wall outlet may sometimes improve reception.

TUNING. Stations are tuned in with the large upper knob.

ANTENNA. A built-in Ferrite Magnetic Iron Core Antenna eliminates the need for an outside antenna. When receiving a weak station, rotate the receiver slightly for best signal strength.

CAUTION: Never connect the radio chassis to a water pipe, radiator, or other ground.

SERVICE NOTES

TO REMOVE CHASSIS FROM CABINET:

1. Remove the four screws which hold the back cover, and remove the cover and line cord.

2. Pull off the two control knobs from the front of the receiver.

3. Remove the Phillips head screw under the tuning knob, on the front of the receiver.

4. From the back, remove the screw which holds the line cord plug.

5. Disconnect the leads from the speaker.

6. From the back, remove the three screws "A" which mount the chassis to the cabinet.

7. Slide the chassis from the cabinet.

CIRCUIT DESCRIPTION

1. The circuit of this chassis is conventional -there are no built-in resistors or capacitors. Leads are printed on both sides of the chassis base, thereby replacing the usual connecting wires and making wiring more uniform.

LIST APPLICABLE BULLETINS & SUPPLEMENTS HERE:

MOTOROLA, INC. 4545 AUGUSTA BLVD. CHICAGO 51, ILLINOIS

Part No. 68P630491 Price 10 Cents Printed in U.S.A.

2. The metal printing extends through all the holes on the chassis, connecting circuits on the front with those on the rear.

3. Reference to the schematic diagram and to Figures 3 and 4 will permit the circuit to be traced easily. Figures 3 and 4 show the front and rear of the chassis, wired and unwired.

SAFETY PRECAUTIONS

1. The chassis of this receiver is connected directly to the power line. However, the power cord circuit is broken by an interlock when the cabinet back is removed for replacing tubes. When aligning or servicing the chassis from AC, an isolation transformer should be inserted between the power line and the chassis.

2. Do not service the chassis on a metal plate, because of the possibility of a short circuit.

3. Use caution when handling the chassis with power applied, because all high voltage leads are exposed.

4. The outer edges of the chassis and the large printed areas in the center are at ground potential.

COMPONENT REPLACEMENT

1. To prevent tube breakage, remove them before replacing components. CAUTION: Remove the tubes only by pulling them straight out. Wiggling a tube may bend a socket clip, causing poor contact with the tube pin.

2. WHEN REMOVING DEFECTIVE COMPONENTS USE ONLY A SMALL SOLDERING IRON (60 WATTS OR LESS) TO AVOID DAMAGE TO THE WIRING. DO NOT USE A SOLDERING GUN. WARNING: THE LEADS ARE VERY THIN, AND EXCESSIVE HEAT WILL BURN THEM OR LOOSEN THEM FROM THE BASE MATERIAL.

3. Printed connections or leads, if damaged, may be replaced with a jumper of regular hookup wire.

4. It is recommended that IF transformers, the volume control, or the electrolytic capacitor be removed by immersing all the lugs simultaneously into a small soldering pot. The component may then be lifted off the chassis easily. If a soldering pot is not available, heat each lug individually with a small soldering iron, and shake off as much molten solder as possible. Then, by alternately heating and loosening each lug, the entire component will be freed. The disadvantage of using a soldering iron instead of a soldering pot is that the printed connections may be pulled loose from the chassis.

5. An individual tube clip may be removed by squeezing it with a pliers and then unsoldering it. The new clip snaps into the hole.

6. Resistors or capacitors may be removed by unsoldering one end at a time.

CAUTION: Clean all the solder from the holes before installing a new component. Do not let the solder run onto an adjacent lead, as a short circuit will be created.

7. Be careful, when removing or replacing the volume control mounting nut or gang mounting screws, that the printing around the holes is not damaged.

ALIGNMENT

NOTE: If AC power is used, insert an isolation transformer between the power line and the receiver to avoid hum and electrical shocks. If an isolation transformer is not available, connect the low side of the signal generator to ground (the outer edges of the chassis) through a .1 mf capacitor.

1. Connect a low range output meter across the speaker voice coil.

2. Connect the low side of the signal generator to ground.

3. Set the signal generator for 400 cycle, 30% modulation.

4. Turn the receiver volume control to maximum.

5. Use a small fibre screwdriver for aligning the IF and diode transformers (a "K-Tran" alignment tool is recommended).

6. Adjust the signal generator output to produce .40 volts (.05 watts) across the voice coil. As stages are aligned, reduce the generator output (not receiver volume control) to maintain the .40 volt level, to avoid overloading the receiver.

7. See Figure 2 for adjustment locations and the following chart for procedure.

ALIGNMENT CHART

STEP	DUMMY ANTENNA	GENERATOR CONNECTION	GENERATOR FREQUENCY	GANG SETTING	ADJUST	REMARKS
IF ALIGNMENT						
1.	.1 mf	Grid of conv. (pin 7, 12BE6)	455 Kc	Fully open	1, 2, 3 & 4 (IF cores)	Adjust for maximum.
RF ALIGNMENT						
2.	.1 mf	Grid of conv. (pin 7, 12BE6)	1620 Kc	Fully open	5 (Osc)	Adjust for maximum.
3.	-	Radiation loop*	1400 Kc	Tune for max	6 (Ant)	Adjust for maximum.

* Connect generator output across 5" diameter, 5 turn loop and couple inductively to receiver loop. Keep loops at least 12" apart.

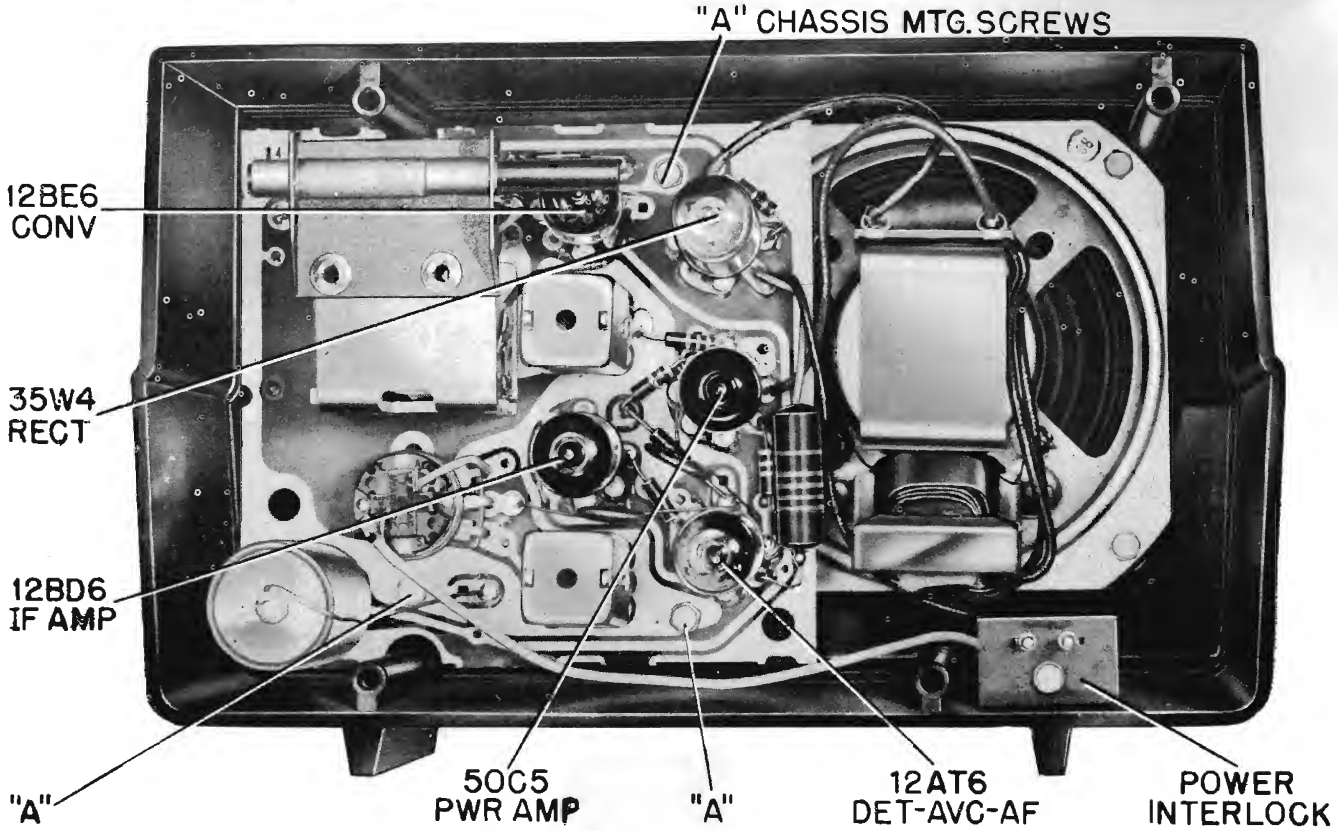


FIGURE 1. REAR VIEW OF RECEIVER

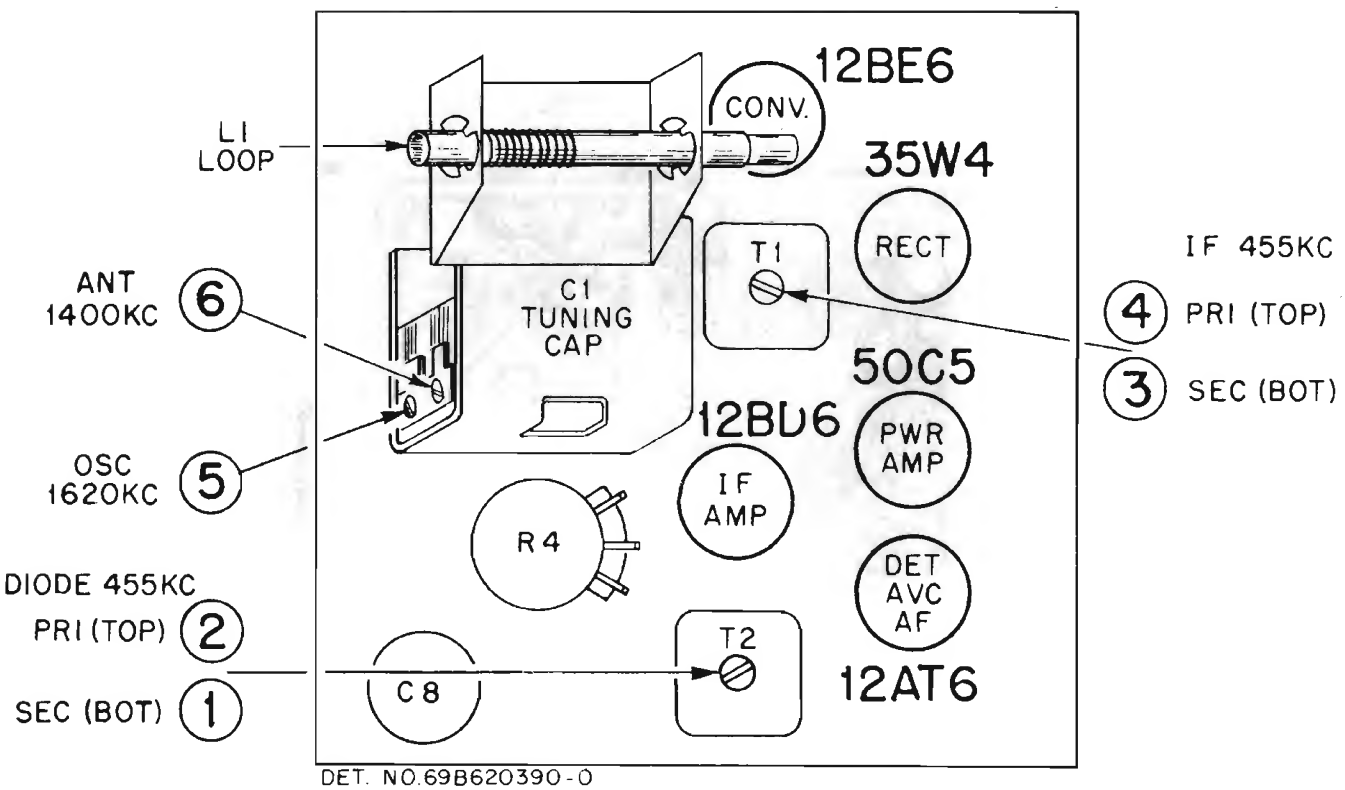
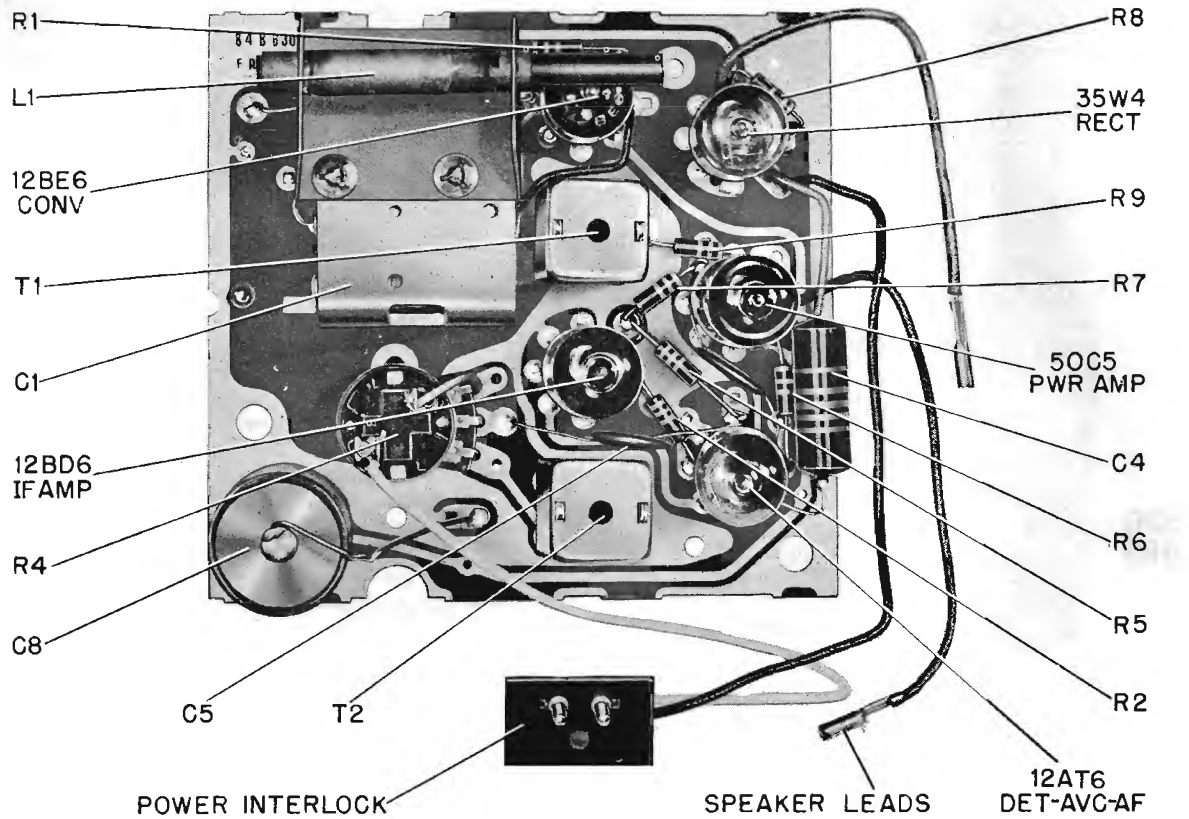


FIGURE 2. TUBE AND TRIMMER LOCATIONS



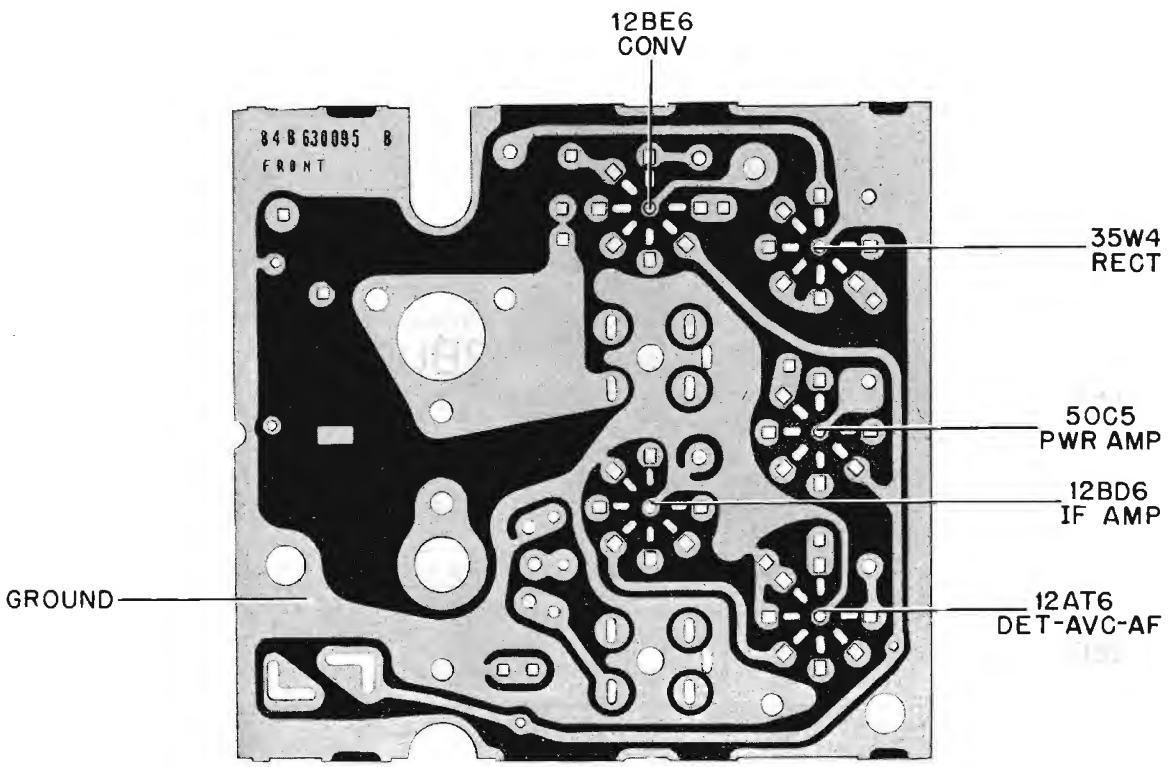
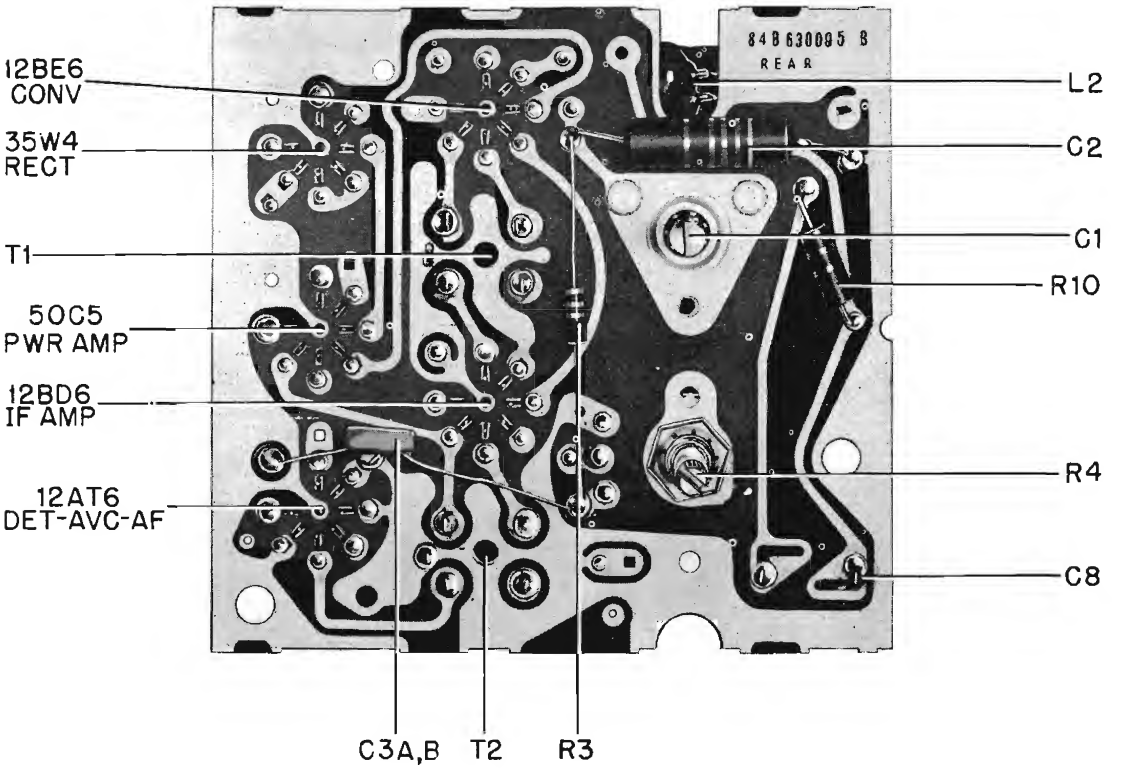


FIGURE 3. FRONT VIEW OF CHASSIS-WIRED AND BLANK



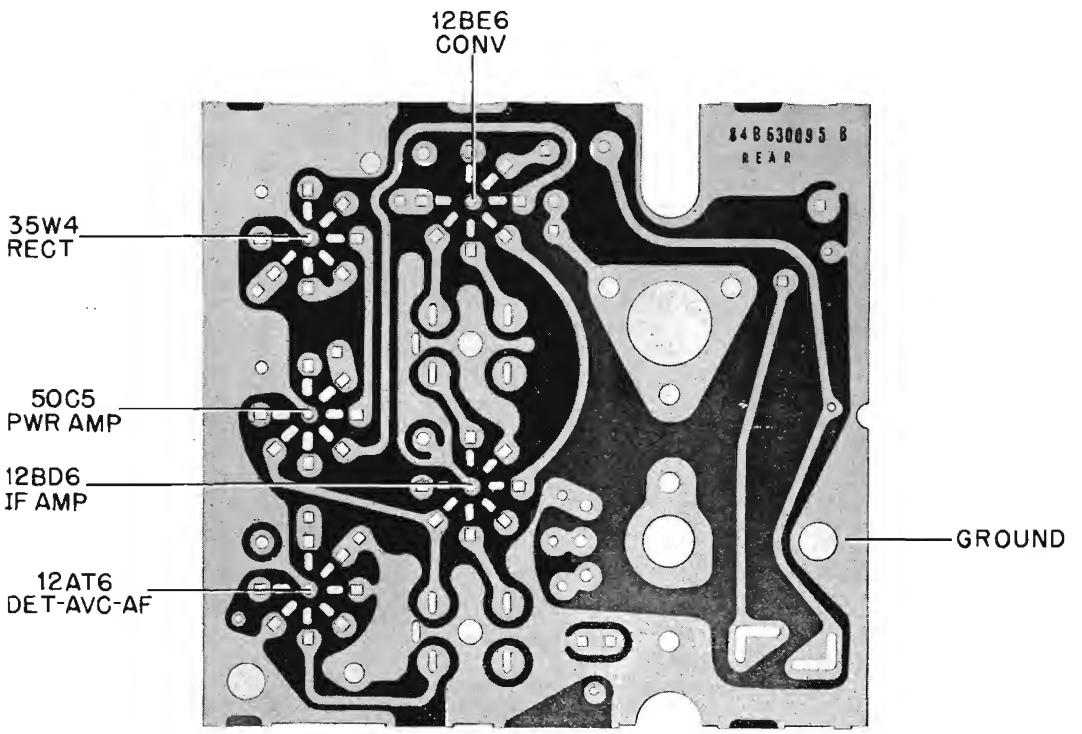
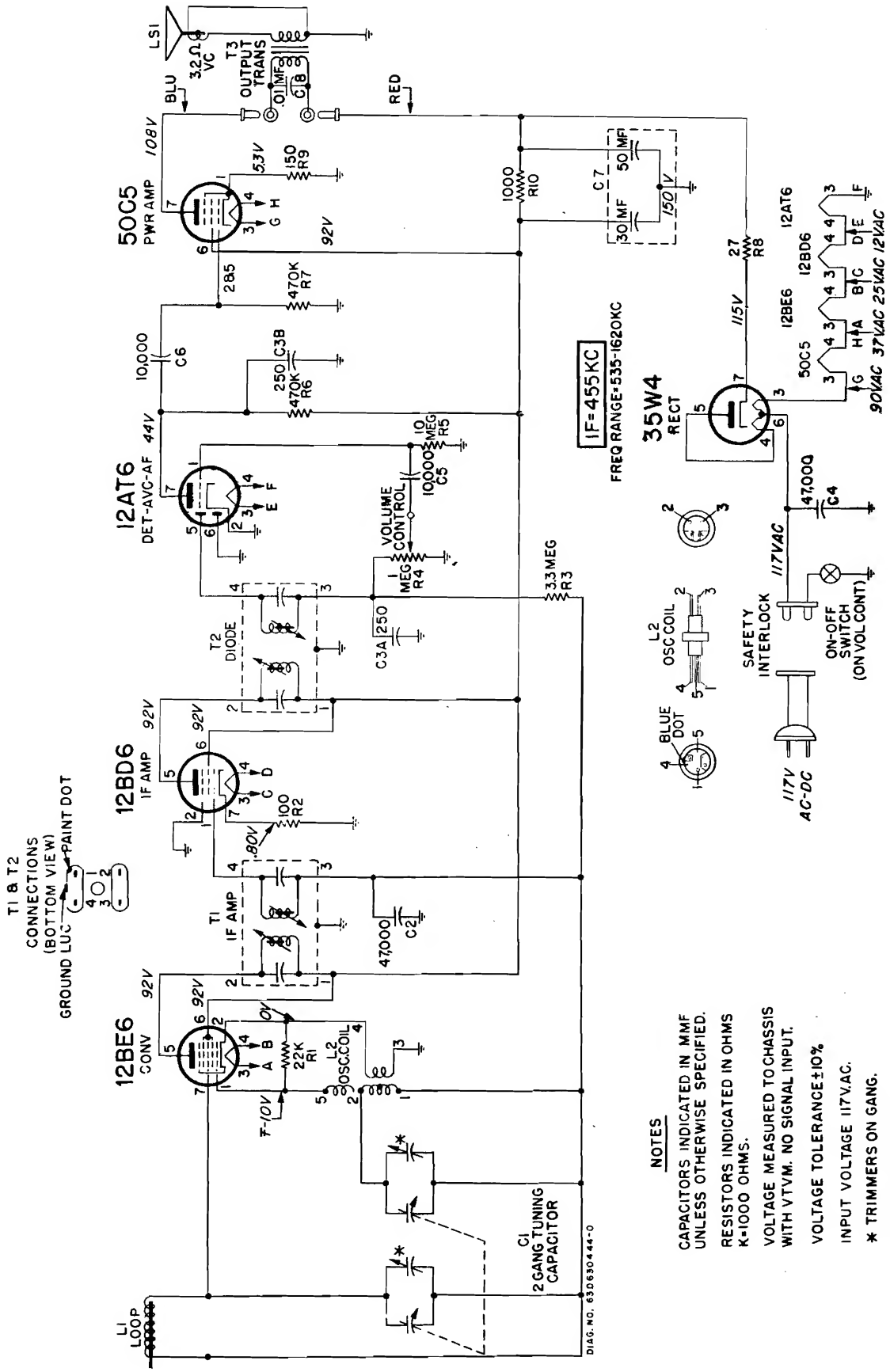


FIGURE 4. REAR VIEW OF CHASSIS-WIRED AND BLANK



NOTES

CAPACITORS INDICATED IN MMF UNLESS OTHERWISE SPECIFIED.

RESISTORS INDICATED IN OHMS K=1000 OHMS.

VOLTAGE MEASURED TO CHASSIS WITH VTVM. NO SIGNAL INPUT.

VOLTAGE TOLERANCE ±10%

INPUT VOLTAGE 117V.AC.

* TRIMMERS ON GANG.

∓ GANG FULLY OPEN.

FIGURE 5. SCHEMATIC DIAGRAM

REPLACEMENT PARTS LIST

NOTE:. When ordering parts, specify model number of set in addition to part number and description of part.

Ref. No.	Part Number	Description	List Price
CHASSIS PARTS - ELECTRICAL			
Capacitors			
C-1	19B610626	Variable, 2-gang.....	2.75
C-2	8K490206	Molded paper: 47,000 mmf 400V	.30
C-3A, B	21B484337	Ceramic, dual: 250-250 mmf 450V.....	.30
C-4	8R490232	Molded paper: 47,000 mmf 400V	.30
C-5	21R482726	Ceramic disc: 10,000 mmf 450V	.30
C-6	21R482726	Ceramic disc: 10,000 mmf 450V	.30
C-7	23B610627	Electrolytic: 50-30 mf/150V.	1.35
C-8	8R9801	Paper: .01 mf 100V.....	.20
Coils			
L-1	24A610646	Antenna loop: with core.....	.50
L-2	24B630159	Oscillator coil.....	.20
Speaker			
LS-1 or	50K620141 50K620142	Speaker: 4" PM; 3.2 ohm VC; includes T-3 and C-9.....	6.35*
		exch	4.75
Resistors			
	Note:	All resistors are insulated carbon type unless otherwise specified.	
R-1	6R6028	22,000 20% 1/2W.....doz	1.20
R-2	6R6018	100 20% 1/2W.....doz	1.20
R-3	6R2118	3.3 meg 20% 1/2W.....doz	1.20
R-4	18A610857	Volume control: 1 meg; with switch.....	1.00
R-5	6R2109	10 meg 20% 1/2W.....doz	1.20
R-6	6R6032	470,000 20% 1/2W.....doz	1.20
R-7	6R6032	470,000 20% 1/2W.....doz	1.20
R-8	6R5683	27 10% 1/2W.....doz	1.20
R-9	6R3992	150 20% 1/2W.....doz	1.20
R-10	6R3953	1000 20% 1W.....	.20
Transformers			
T-1,2	24K610639	IF and Diode Transformer: 455 Kc: complete.....	1.50
T-3	25K610631	Output Transformer.....	1.50

Part Number	Description	List Price
CHASSIS PARTS - MECHANICAL		
42A610632	Clip, tube pin.....per/c	.50
1V620210	Insulator, antenna loop: fibre; with lug.....	.20
2S7051	Nut, hex: Palnut; 3/8-32 x 9/16 (volume control mtg).....doz	.15
28A610679	Plug, line cord (interlock).....	.15
46B780452	Stud, trimount (ant insulator mtg).....doz	.15
29A620057	Terminal, pin (on speaker leads).....doz	.25
CABINET PARTS		
16C611255	Cabinet, table model: walnut (52R11B).....	3.60*
16K611256	Cabinet, table model: ivory (52R12B).....	4.80*
16K611258	Cabinet, table model: maroon (52R13B).....	4.80*
16K611259	Cabinet, table model: gray (52R14B).....	4.80*
16K611260	Cabinet, table model: green (52R15B).....	4.80*
16K611261	Cabinet, table model: red (52R16B).....	4.80*
30K610638	Cord, line: with plug & receptacle.....	.95
1V630134	Cover, cabinet back: with line cord.....	1.30
15K620103	Cover, speaker: walnut (52R11B)..	.70
15K620104	Cover, speaker: ivory (52R12B)...	1.05
15K620105	Cover, speaker: maroon (52R13B)..	1.05
15K620106	Cover, speaker: gray (52R14B)....	1.05
15K620107	Cover, speaker: green (52R15B)...	1.05
15K620108	Cover, speaker: red (52R16B).....	1.05
36K611308	Knob, tuning: black (52R11B, 52R13B, 52R14B, 52R15B, 52R16B).	.40
36K620090	Knob, tuning: ivory (52R12B).....	.40
36K620156	Knob, volume control: black (52R11B, 52R13B, 52R14B, 52R15B, 52R16B).....	.10
36K610642	Knob, volume control: ivory (52R12B).....	.10
64A610790	Screen, speaker covering.....	.45
3S115138	Screw, machine: 6-32 x 1-9/16 Phillips flat head; cad pl (chassis mtg -through front of cabinet).....doz	.20
3S115237	Screw, thread cutting: 6-20 x 5/16 pl hex head; cad pl (spkr mtg).....doz	.40
3S115240	Screw, thread cutting: 6-20 x 1/2 pl hex head; cad pl (chassis mtg & back cover mtg).....	.05
2S400014	Speednut (spkr cover mtg).....	.05

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

*Plus Federal Excise Tax At Current Rate